CLAIMS

The invention claimed is:

1. A gene encoding a polypeptide which is a human 116-kDa osteoclast proton pump subunit.

2. A gene according to Claim 1, wherein the gene comprises a nucleotide sequence consisting of SEQ ID NO: 1.

3. Isolated DNA encoding a polypeptide which is an osteoclast 116-kDa proton pump subunit and comprising the nucleotide sequence of SEQ ID NO: 1 or its complementary nucleotide sequence.

4. Isolated DNA encoding a polypeptide which is a human osteoclast proton pump subunit and which comprises the amino acid sequence of SEQ ID NO: 3.

5. Isolated DNA encoding a polypeptide which is an osteoclast proton pump subunit, comprising a nucleotide sequence selected from the group consisting of:

a) SEQ ID NO: 1 or its complementary nucleotide sequence; and

b) nucleotide sequences which hybridize under conditions of medium stringency to the nucleotide sequences of (a).

6. A polypeptide encoded by the gene of Claim 1.

7. A polypeptide encoded by the isolated DNA of Claim 3.

8. A polypeptide encoded by the isolated DNA of Claim 4.

9. A polypeptide which is a human 116-kDa osteoclast proton pump subunit.

10. A polypeptide according to Claim 9, wherein the polypeptide comprises the amino acid sequence of SEQ ID NO: 2.

11. An antibody which binds the polypeptide of Claim 6.

12. An antibody which specifically binds the polypeptide of Claim 9.

13. An assay for identifying an agent which alters the rate of bone degradation in an organism, comprising the steps of:

a) administering to an organism an agent to be tested, thereby producing a test organism;

b) determining the rate of bone degradation in the test organism; and

c) comparing the rate of bone degradation determined in step (b) with the rate of bone degradation in a control organism to which the agent to be tested is not administered,

wherein a difference in the rate of bone degradation between the test organism and the control organism indicates that the agent alters the rate of bone degradation.

14. A method for treating a bone mass disorder characterized by an undesirably high rate of bone degradation, comprising administering a therapeutically effective dose of a pharmaceutical composition comprising an antagonist of a polypeptide which is a human 116-kDa osteoclast proton pump subunit to a subject having a bone mass disorder characterized by an undesirably high rate of bone degradation, thereby reducing the rate of bone degradation in the subject.

15. A method according to Claim 14, wherein the bone mass disorder is osteoporosis or osteoarthritis.

16. A method for treating a bone mass disorder characterized by an undesirably low rate of bone degradation, comprising administering a therapeutically effective dose of a pharmaceutical composition comprising a polypeptide which is a human 116-kDa osteoclast proton pump subunit or an agonist of a polypeptide which is a human 116-kDa osteoclast proton pump subunit to a subject having a bone mass disorder characterized by an undesirably low rate of bone degradation, thereby increasing the rate of bone degradation in the subject.